

In re Patent Application of:
CALDWELL, JR.
Serial No. 10/655903
Filed: **SEPTEMBER 5, 2003**

In the Claims:

Claims 1-9 (cancelled)

10. (previously presented) A method of manufacturing an article comprising the steps of:

- (a) providing a rigid outer female mold element having an interior surface associated with a first surface of said article;
- (b) providing a rigid inner male mold element having an exterior surface associated with a second surface of said article, and being sized to be placed within an interior region of said outer female mold element, so as to define a mold assembly-forming and unsealed annular mold cavity between said interior surface of said outer female mold element and said exterior surface of said inner male mold element, said inner male mold element having a perimeter sidewall that is adapted to extend a vertical distance alongside, but spaced apart from, a mutually facing interior sidewall of said outer female mold element when said inner male mold is inserted into said outer female mold, such that said inner mold element is not sealed against said outer female mold element;
- (c) placing a structural preform within said interior region of said outer female mold element;
- (d) introducing a volume of liquid resin into said interior region of said female mold element, thereby wicking fibers of said structural preform and producing a resin-impregnated preform, said volume of liquid resin being larger than the volume of said annular mold cavity defined between said outer female mold element

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and said inner mold element when inserted into said outer female mold element;

(e) inserting said inner male mold element within said interior region of said outer female mold element, and performing only mandrel-based compression of said inner male mold element against said resin-impregnated preform produced at said interior region of said female mold element in step (d), while spacing said inner male mold element apart from said outer female mold element by a prescribed spatial offset that forms geometry parameters of said unsealed annular mold cavity, as well as a generally continuous narrow annular channel that is contiguous with said unsealed mold cavity, and through which air is vented and into which resin introduced in step (d) is allowed to expand from said annular mold cavity, as said inner male mold element is compressed against said liquid resin; and

(f) after curing of said resin, removing said mold assembly to produce a resin transfer molded article.

11. (previously presented) The method according to claim 10, wherein step (e) comprises spacing said inner male mold element apart from said outer female mold element by means of a plurality of indexing elements, which engage said inner male mold element and said outer female mold element, and provide said prescribed spatial offset that forms geometry parameters of said unsealed mold cavity between said inner male mold element and said outer female mold element.

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12. (previously presented) The method according to claim 11, wherein step (e) comprises clamping said inner male mold element into a fixed position within said interior region of said outer female mold element, so as to retain said inner male mold element in a mold cavity-forming position.

13. (previously presented) The method according to claim 10, further including the step of:

(g) removing a band of cured resin formed along an edge of said resin transfer molded article provided in step (e) as a result of resin outflow from said mold cavity into said channel.

14. (previously presented) A method of manufacturing a resin transfer molded article comprising the steps of:

(a) providing a rigid outer female mold element having an interior surface associated with a first surface of said article;

(b) providing a rigid inner male mold element having an exterior surface associated with a second surface of said article, and being sized to be placed within an interior region of said outer female mold element, so as to define a mold assembly forming an unsealed mold cavity between said interior surface of said outer female mold element and said exterior surface of said inner male mold element, said inner male mold element having a perimeter sidewall that is adapted to extend a vertical distance alongside, but spaced apart from, a mutually facing interior sidewall of said

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outer female mold element when said inner male mold is inserted into said outer female mold, such that said inner mold element is not sealed against said outer female mold element;

(c) placing a structural preform within said interior region of said outer female mold element;

(d) introducing a volume of liquid resin into said interior region of said female mold element, thereby wicking fibers of said structural preform and producing a resin-impregnated preform, said volume of liquid resin being larger than the volume of said unsealed mold cavity defined between said outer female mold element and said inner mold element when inserted into said outer female mold element;

(e) providing a plurality of indexing elements, which engage said inner male mold element and said outer female mold element, and provide a prescribed spatial offset that forms geometry parameters of an unsealed mold cavity between said inner male mold element and said outer female mold element;

(f) inserting said inner male mold element within said interior region of said outer female mold element, and performing only mandrel-based compression of said inner male mold element against said resin-impregnated preform produced at said interior region of said female mold element in step (d), while said indexing elements cause said inner male mold element to be spaced apart from said outer female mold element by said prescribed spatial offset that forms geometry parameters of said unsealed mold cavity, as well as a generally continuous narrow annular

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channel that is contiguous with said unsealed mold cavity, and through which air is vented and into which resin introduced in step (d) is allowed to expand from said mold cavity as a result of mandrel-compression of said inner male mold element against said resin-impregnated preform at said interior region of said female mold element;

(g) clamping said inner male mold element into a fixed position within said interior region of said outer female mold element, so as to retain said inner male mold element in a mold cavity-forming position, and allowing said resin to cure; and

(h) after curing said resin, removing said mold assembly and removing a band of cured resin formed along an edge of said resin transfer molded article as a result of resin outflow from said mold cavity into said channel to thereby form said resin transfer molded article.